

NEW WAYS TO MEASURE VOC EMISSIONS

BY

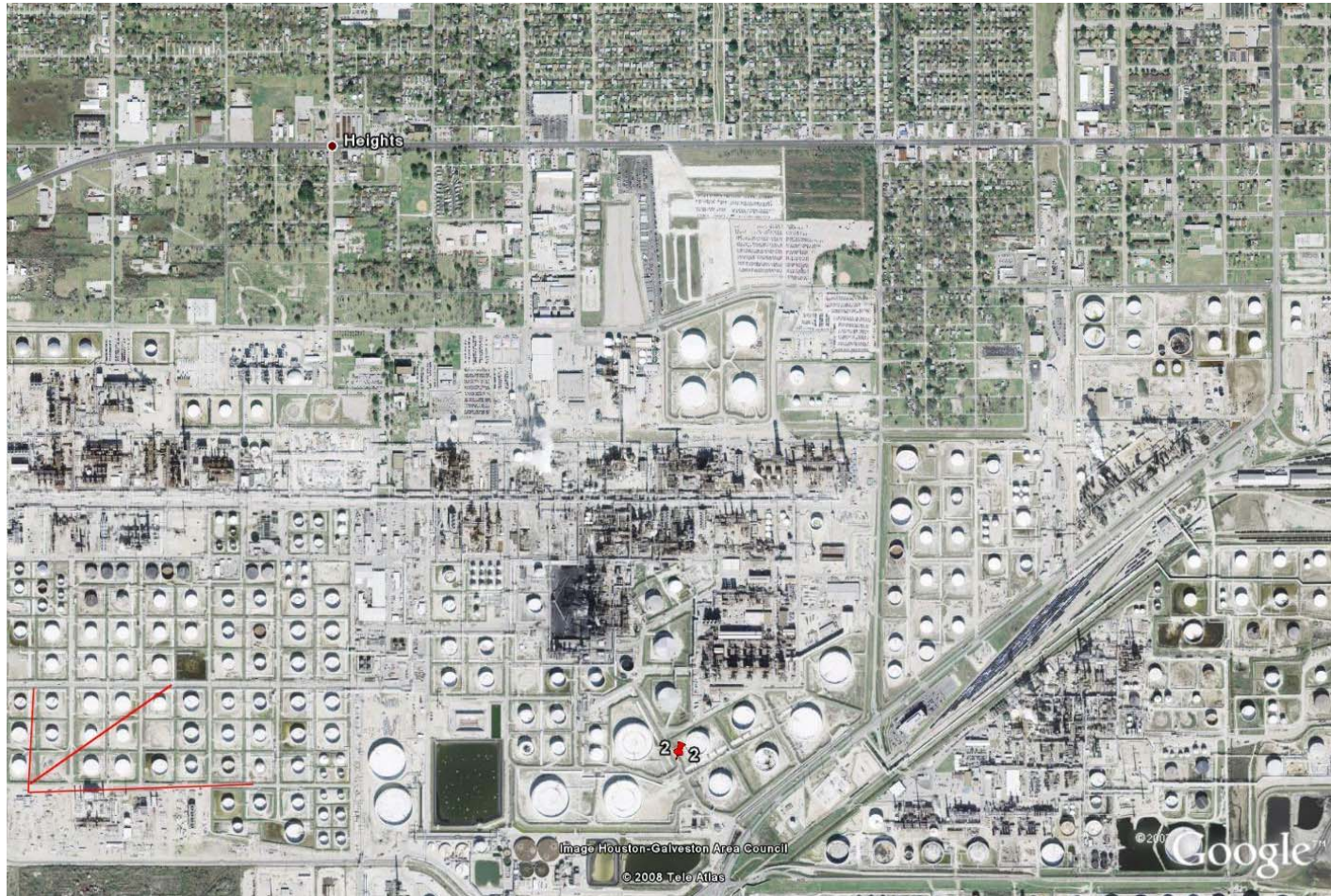
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NEW DYNAMICS

- NON-TRADITIONAL SOURCES
- CLARITY OF HUMAN RISK EXPOSURES
- FUTURE REGULATIONS & GLOBAL ISSUES
- INCREASED EMISSIONS MONITORING IN PERMITS
- REVISIONS TO SIP STRATEGIES
- EVOLUTION OF TECHNOLOGIES

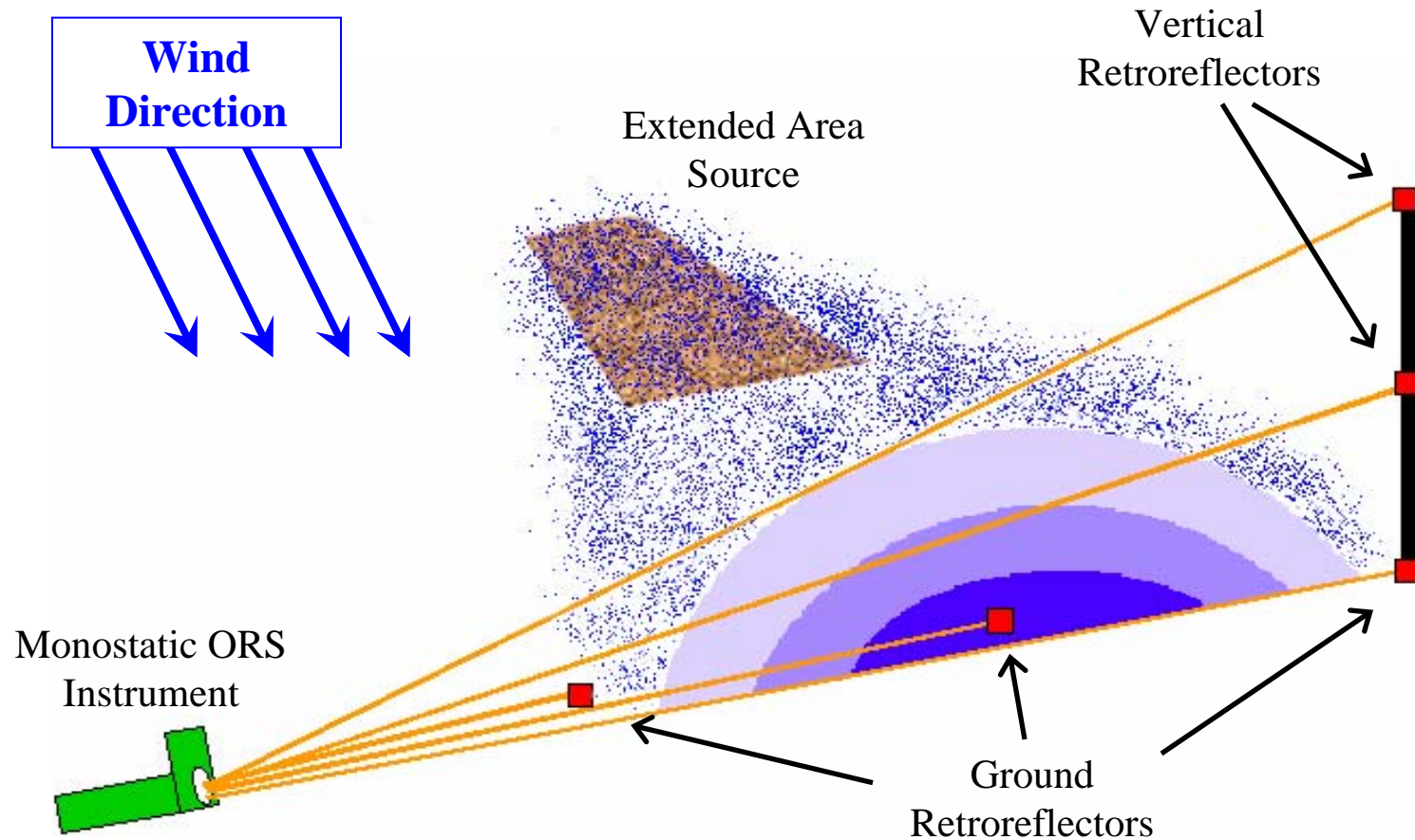
What Are the Real Emissions?



HISTORY OF REMOTE SENSING OF EMISSIONS

- PRIMITIVE PRE-1990'S
- OVERPROMISES OF THE 1990'S
- IMPROVED DETECTORS, LASERS, AND SOFTWARE NOW AVAILABLE
- SAMPLING COMPLEXITIES AND MODELING ELIMINATED BY NEW APPROACHES

Area Source Emission Measurement Using EPA Method OTM-10



"Optical Remote Sensing for Emission Characterization from Non-point Sources"
EPA OTM 10 ,FINAL ORS Protocol, June 14, 2006. <http://www.epa.gov/ttn/emc/prelim/otm10.pdf>.

RECENT WORK

- FINDING MUTUAL INTERESTS WITHIN THE AGENCY AND WITH DoD
- OAQPS WORKSHOPS AND CO-FUNDED DEMONSTRATIONS
- NEW NATIONAL PROTOCOLS
- BETTER FIELD STUDIES, VALIDATIONS, AND CONFIRMATION OF EMISSIONS
- NEW SOURCES MEASURED: LANDFILLS, MARINE SOURCES, AND AGRICULTURE OPERATIONS
- OLD SOURCES REVISITED: REFINERY STUDIES

THE NEW EQUIPMENT

- FTIR
 - DOAS
 - DIAL
 - INFRA-RED CAMERAS
-
- MULTI-POLLUTANTS
 - VIRTUAL BOXES
 - SEE THE ACTUAL EMISSIONS REAL-TIME

THE POLLUTANTS

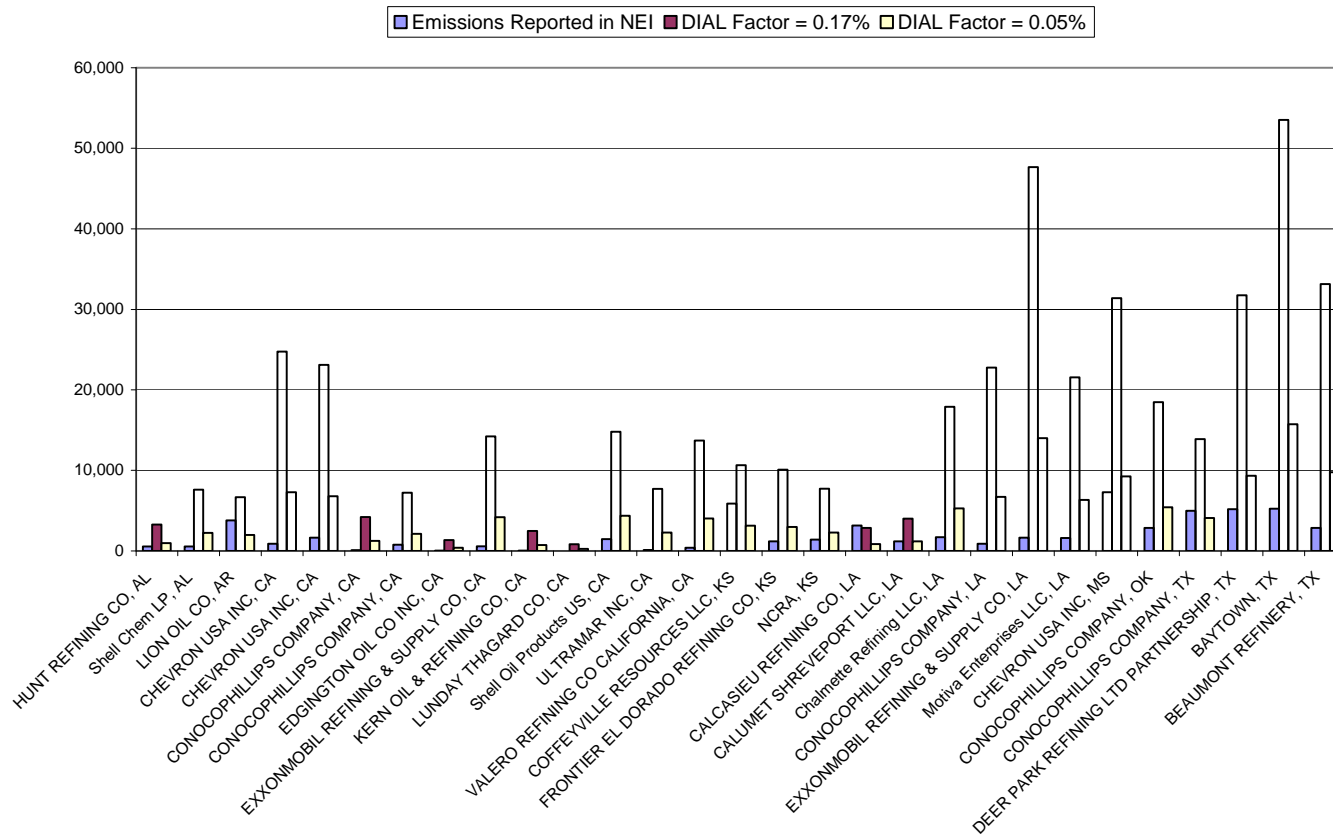
- GASES NOW-- PM IN FUTURE YEARS
- TOTAL VOCs
- SPECIATED VOCs
- AMMONIA
- SULFUR COMPOUNDS

PRELIMINARY RESULTS

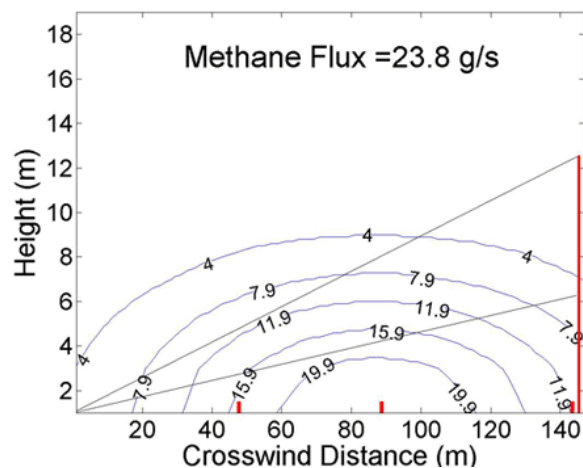
- MUCH GREATER VOC EMISSIONS THAN PREVIOUSLY REPORTED—SAME FOR TOXIC AIR POLLUTANTS
- THE NEW TECHNOLOGIES **DO** WORK AND GIVE MORE ACCURATE AND CONTINUOUS EMISSION RATES
- EMISSIONS OF MANY IMPORTANT VOC EMITTERS REMAIN UNKNOWN (AIRPORTS, FLARES, WELLHEADS, BARGES, MARINE LOADING, FEEDLOTS, LANDFILLS)

REFINERY STUDIES

Compare 02 NEI VOC Emissions By Facility to Calculated Emissions, tpy



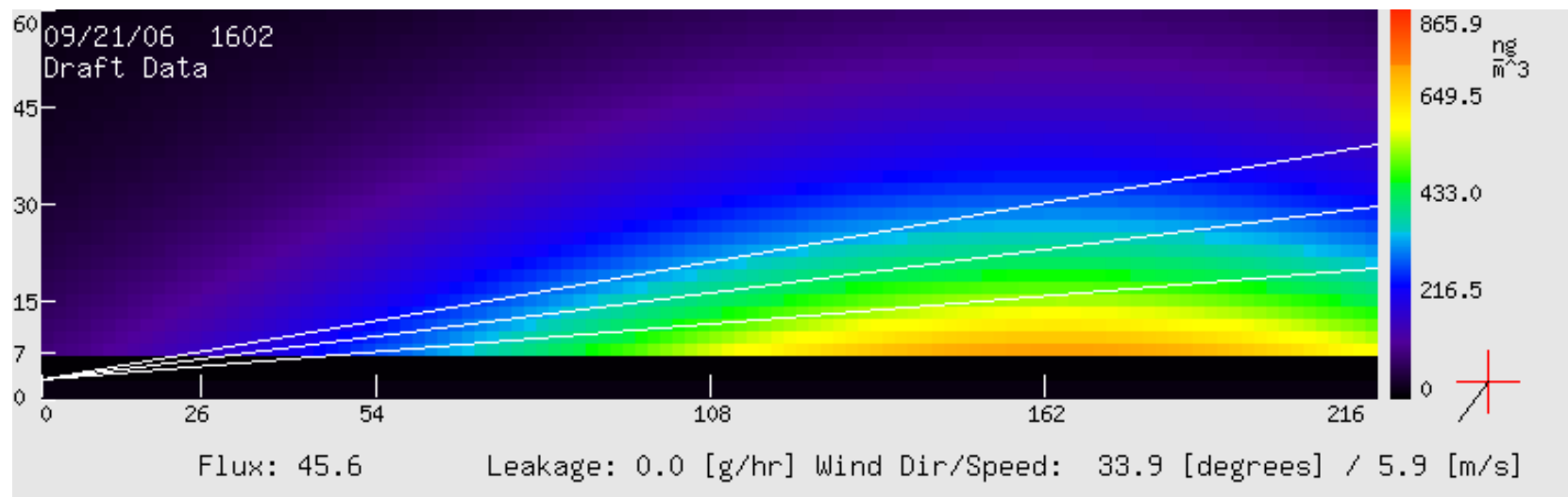
ORS Measurements of Landfills and Brownfields



"Open-Path Tunable Diode Laser Absorption Spectroscopy for Acquisition of Fugitive Emission Flux Data", E. Thoma, et al, Jor. of the Air and Waste Manage Assoc 55, 658-668 (2005).

"Evaluation of Fugitive Emissions Using Ground-Based Optical Remote Sensing" U.S. EPA Report EPA/600/R-07/032 (2007), at Web Site: <http://www.epa.gov/nrmrl/pubs/600r07032/600r07032.pdf>

ORS Measurements of Industrial Facilities

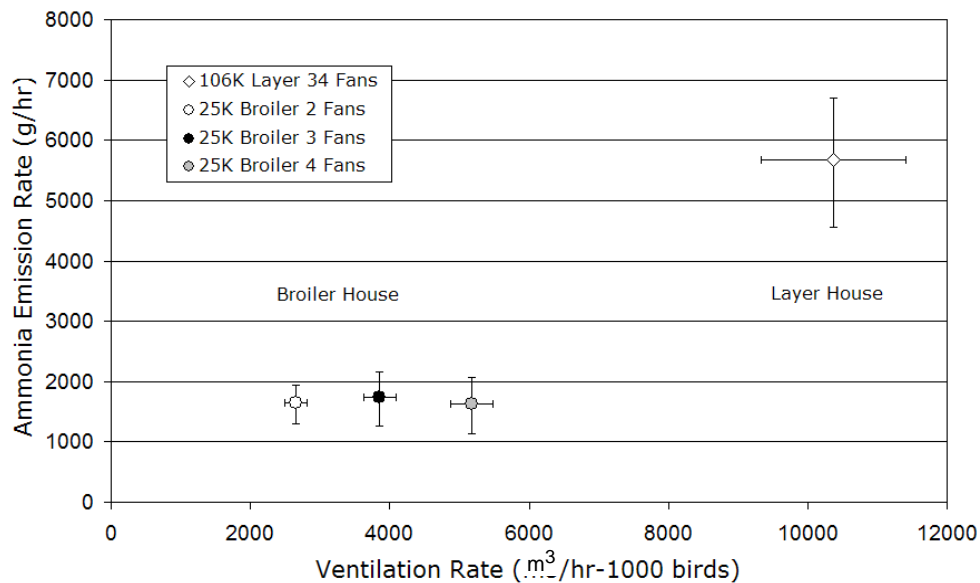


"EPA, 2007, Measurement of Total Site Mercury Emissions from a Chlor-alkali Plant Using Open-Path UV-DOAS" U.S. EPA Report EPA/600/R-07/077 (2007) at Web Site <http://www.epa.gov/nrmrl/pubs/600r07077/600r07077.pdf>

ORS Measurements of Agricultural Operations



NH₃ Emission Rate Estimates Broiler & Layer Houses



"Measurement of Ammonia Emissions from Poultry Houses using Tunable Diode Laser Spectroscopy"
E. Thoma et al, Proceedings of the Annual Conference of Air & Waste Manage Assoc. (2005)

APRIL 1-3, 2008 WORKSHOP

- `<http://www.epa.gov/ttn/chief/efpac/workshops/remotesens08.html>`

FUTURE WORK

- WORK-GROUPS STARTING
- NEW IN-DEPTH STUDIES
- MILITARY FOCUS
- EXTENDED APPLICATIONS

NEEDED

- EPA AND STATE/LOCAL AGENCIES TOGETHER RECOGNIZE:
- THE **NECESSITY** FOR MORE CONTINUOUS AND COMPLETE EMISSIONS MONITORING IN VERIFYING CURRENT PERFORMANCE, AND
- **REQUIRE** THE USE OF THESE NEW KINDS OF EMISSIONS MONITORS IN RULES, REGULATIONS, AND PERMITS